

What is claimed is:

1. A method of defining printer media and inking intensity comparability in a printing system comprising the steps of:

- 5 identifying a printer and a substrate for use in color printing;
printing a color test pattern of a plurality of test patches with
the identified printer and the identified substrate;
generating a tone scale curve for each ink in the color test
pattern using the plurality of test patches;
10 selecting one limiting condition for the identified printer and
substrate;
determining an upper ink limit based on ink and substrate
parameters; and
15 using the upper ink limit to generate a tone scale to calibrate
any ink color on any substrate for the printing system.

2. A method as claimed in claim 1 wherein the step of generating a tone scale curve comprises the steps of:

- 20 plotting the color test pattern in $L^*a^*b^*$ color space
referenced from substrate color; and
using Euclidian distance from the substrate color as a
measure of color intensity.

3. A method as claimed in claim 2 further comprising the steps of:

fitting a curve to the $L^*a^*b^*$ data plot defined by the
substrate color;

5 linearly increasing applied ink level to a specified upper ink
limit ; and

deriving a corresponding one dimensional transform that
will operate on imaging data to force the imaging data to conform to a
predetermined data.

10 4. A method as claimed in claim 3 further comprising the step of generating a
transfer function that produces a linear relationship from the substrate color to
a maximum ink limit in $L^*a^*b^*$ color space.

15 5. A method as claimed in claim 1 wherein the plurality of test patches
linearly increase in applied inking level over an entire dynamic range of the
printing system.

20 6. A method as claimed in claim 1 further comprising the step of using a
spectrophotometer to scan the color test pattern to determine a three-
dimensional color coordinate of each of the plurality of test patches and the
substrate.

7. A method as claimed in claim 1 wherein the step of determining an upper
ink limit comprises the steps of:

25 determining a first upper ink limit for preferred color text;
determining a second upper ink limit for graphics.

8. A method as claimed in claim 7 wherein the total upper ink limit comprises
the first upper ink limit and the second upper ink limit.

9. A method as claimed in claim 8 wherein the upper ink limit of each ink color in a printing is derived from a subjective determination of the total upper ink limit.

5 10. A method as claimed in claim 1 wherein the upper ink limit of each ink color in a printing used for graphics is derived from a subjective determination of the total upper ink limit.

10 11. A method as claimed in claim 1 wherein the upper ink limit of each of the colors in a printing for text is derived from the subjective determination of the total upper ink limit for the preferred text color.

15 12. A method as claimed in claim 1 wherein the upper ink limit of each of the colors in a printing for text is derived from a subjective determination of a total upper ink limit for a preferred text color with a minimum threshold condition applied to assure fully formed characters of non-preferred colored text.

20 13. A method as claimed in claim 1 wherein the color test pattern comprises a test pattern containing image and graphics data that brackets a usable range of ink loading over a range of acceptable substrates for color printing operations to determine a suitable upper ink limit on a particular substrate.

14. A method of defining printer media and inking intensity compatibility in a printing system comprising the steps of:

identifying a printer having a plurality of inks and a substrate for use in color printing;

5 printing a color test pattern with the identified printer and the identified substrate;

employing a portion of the color test pattern for generating a tone curve for each of the plurality of inks;

10 employing a portion of the color test pattern for determining the threshold for excessive ink coverage for the identified printer and substrate; and

re-calibrating a range of tone scale to remain below the threshold of excessive ink coverage for the plurality of inks on the identified substrate.

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15. A method of defining printer media and inking intensity compatibility in a printing system as claimed in claim 14 wherein the test pattern comprises sub patterns printed with increasing ink coverage levels for identifying the threshold for excessive ink coverage.

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16. A method of defining printer media and inking intensity compatibility in a printing system as claimed in claim 15 wherein the increasing ink coverage levels span a range of thresholds for excessive ink coverage for a variety of substrates.

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17. A method of defining printer media and inking intensity compatibility in a printing system as claimed in claim 14 wherein the color test pattern comprises a pattern which identifies when ink bleed is excessive due to ink coverage exceeding the threshold for excessive ink coverage.

18. A method of defining printer media and inking intensity compatibility in a printing system as claimed in claim 14 wherein the color test pattern comprises a pattern which identifies when ink drying time is excessive due to ink coverage exceeding the threshold for excessive ink coverage.

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19. A method of defining printer media and inking intensity compatibility in a printing system as claimed in claim 14 wherein the color test pattern comprises a pattern which identifies when ink bleed through is excessive due to ink coverage exceeding the threshold for excessive ink coverage.

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20. A method of defining printer media and inking intensity compatibility in a printing system as claimed in claim 14 wherein the color test pattern comprises a pattern which identifies when paper curl is excessive due to ink coverage exceeding the threshold for excessive ink coverage.

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